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R E M A R K S

Claims 1 to 34 were/are pending.

Of the above claims, Claims 7 to 9, 20 to 25, and 33 were withdrawn from consideration by the Examiner based on a restriction requirement.

Claims 1, 13, 23, 26, and 30 are the only independent claims.

Claim 29 has been amended herein.

Claims 1 to 6, 10 to 19, 26 to 32, and 34 stand rejected as being anticipated under 35 U.S.C. Section 102(b) by each of U.S. Patent No. 2,153,071 to Bishop, U.S. Patent No. 2,949,996 to Tonelli, U.S. Patent No. 3,058,604 to Harper, and U.S. Patent No. 3,131,801 to Marchetti. Claim 3 also stands rejected under 35 U.S.C. Section 112(Para. 2) as being unclear. Applicants respectfully traverse these rejections.

A. Amendment of Claim 29

Claim 29 has been amended herein to depend from Claim 26 instead of withdrawn Claim 23. It appears that Claim 29 was inadvertently dependent on Claim 23. No change in scope is intended by this amendment.

B. Section 112(Para. 2) Rejection of Claim 3

The Examiner appears to assert that because Claim 2 recites that the controller is adapted to raise the unload mechanism, that there must be more than a substantially zero velocity component in the vertical direction (z-direction) in the adaptation recited in Claim 3. This assertion is clearly incorrect. The following passage

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quoted from Applicants' specification (bold emphasis added) explicitly describes that the raising of the unload mechanism as recited in Claim 2 may occur at a time (T3) distinctly different than the time (T4) that the unload mechanism contacts the substrate carrier as recited in Claim 3. As explained below, this allows a substantially zero velocity or less in a vertical direction to be achieved at time T4 (on Fig. 13D):

With reference to FIGS. 13C-D and curves C1-C4, the end effector 225 may perform similar raisings, lowerings, and accelerations as described with reference to FIG. 8 during an unload operation. For example, and with further reference to FIGS. 8 and 9A-E, after receiving a trigger signal for an unload operation (step 303), the end effector 225 accelerates to match the velocity of the conveyor 231 in the x-direction (curve C1') between times T1 and T2 (step 305 and FIG. 9A). Thereafter, between times T3 and T4, the end effector 225 is raised (curve C3') so that the kinematic features 229 engage the concave features 407 of the substrate carrier 207 to be unloaded from the conveyor 231 (step 311 and FIG. 9B). At time T4, the end effector 225 stops raising as the kinematic features 229 engage the concave features 407 (curves C2' and C3'). Between times T4 and T5, the end effector 225 is raised further so as to lift the flange 402 of the substrate carrier 207 off of the carrier engagement member 401 (step 311 and FIG. 9C). The substrate carrier 207 thereby is unloaded from the carrier engagement member 401 with substantially zero velocity and/or acceleration (e.g., in the x, y and/or z-directions due to the halting of z-axis motion at time T4 prior to lifting the substrate carrier 207 from the carrier engagement member 401 and due to speed matching between the end effector 225 and the conveyor 231). Following time T5, the end effector 225 decelerates and reaccelerates (step 313 and curve C1') and lowers (step 315 and curve C3') to clear the carrier engagement member 401 as previously described and as shown in FIGS. 13C-D.

Accordingly, unloading/loading of substrate carriers from/onto a moving conveyor may occur with substantially zero velocity and/or acceleration in one or more directions, more preferably in two directions, and most preferably in all directions. Substantially zero velocity and acceleration in a vertical direction are preferred; and zero velocities and/or accelerations, rather than substantially zero velocities and/or accelerations, during unloading/loading are more preferred. As used herein, "zero velocity" or "zero acceleration" mean as close to zero as possible given system variations such as conveyor height, conveyor speed, actuator repeatability, etc.,

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system limitations such as controller resolution, actuator resolution, end effector position tolerances, etc., and/or the like. "Substantially zero velocity" or "substantially zero acceleration" mean sufficiently close to zero so that a substrate carrier may be unloaded from and/or loaded onto a moving conveyor and/or carrier engagement member without damaging a substrate contained within the substrate carrier and/or generating potentially damaging particles. For example, a substrate carrier may be contacted with a relatively small velocity. In one embodiment, an end effector may raise vertically rapidly, and then slow down to a relatively small or substantially zero velocity prior to contacting a substrate carrier. A similar small (or substantially zero) acceleration also may be employed. Similar load operations may be performed. In one embodiment, substrates or substrate carriers are contacted in a vertical direction with less than about 0.5 G of force, and in another embodiment with less than about 0.15 G of force. Other contact force values may be employed. (Specification, pg. 51, ln. 1 to pg. 52, ln. 26, bold emphasis added)

Thus, Applicants respectfully request withdrawal of the Section 112 rejection based on the above passage which makes it clear that the two distinct motions the Examiner identified in Claims 2 and 3 may happen at different times.

C. Section 102(b) Rejection of Claims 1-6, 10-19, 26-32, & 34

Before addressing the Examiner's substantive Section 102 rejections, Applicants hereby assert an objection to the Examiner's manner of examination and the nature of the rejections. As stated in MPEP Section 706.02(1), and counter to the present office action, prior art rejections should ordinarily be confined strictly to the best available art (i.e., a single best reference) to form a rejection. Further, in general, the Examiner has merely provided vague, broad based rejections that do not specifically identify aspects of the relied upon references that the Examiner asserts anticipate each feature of Applicants' claims. Where specific elements are

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identified, no explanation is provided as to how or why the Examiner believes the identified elements anticipate features of Applicants' invention. Thus, providing a complete response to the Examiner's rejections is difficult. The Examiner is respectfully reminded that the pertinence of the references must be clearly explained pursuant to 37 CFR 1.104(c)(2). Clarification and appropriate examination are respectfully requested.

Regarding independent Claims 1, 13, and 26, without providing complete support, the Examiner appears to incorrectly assert that each of the four (apparently cumulative) relied upon references discloses all of the features of these claims. Specifically, the Examiner merely identifies elements in each of the four references and labels them as an unload mechanism, a carrier, and a conveyor. While Applicants do not accept the Examiner's labels (as discussed below), the Examiner does not even assert that the "conveyor [is] adapted to transport a substrate carrier" (or the like) as recited in Claims 1, 13, and 26. In other words, this feature is not addressed at all by the Examiner. In fact, Applicants cannot find, and the Examiner has not identified anywhere within any of the four relied upon references where there is any mention of a substrate carrier at all, much less a "conveyor adapted to transport a substrate carrier." Accordingly, Applicants respectfully request withdrawal of the Section 102 rejection of Claims 1 to 6, 10 to 19, and 26 to 29.

The Examiner is respectfully reminded that features introduced using "adapted to" language must be considered and given patentable weight. This rule is particularly relevant where, as here, the claimed adaptation defines specific features in Applicants' invention as claimed that

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are not met by any of the relied upon references. In other words, none of the relied upon references provide any explanation as to how the described systems could be "adapted to transport a substrate carrier," particularly given the fragile nature and significant value of a substrate in a substrate carrier.

Further, the Examiner has not identified anywhere within the relied upon references Applicants' claim feature of loading or unloading occurring "while the conveyor is moving the substrate carrier" (or the like) as recited in each of Applicants' independent Claims 1, 13, and 26. For this additional reason, Applicants respectfully request withdrawal of the Section 102 rejection of Claims 1 to 6, 10 to 19, and 26 to 29.

Regarding independent Claim 30, several features are recited that are not addressed at all by the Examiner. Specifically, Claim 30 recites "a load port from which a substrate may be loaded to or from a processing tool," "a load/unload mechanism for loading or unloading substrate carriers to or from a factory transport mechanism," a "load/unload mechanism . . . adapted so as to substantially match a velocity of a substrate carrier moving along the factory transport mechanism," and "an apparatus for transporting a substrate carrier between the load/unload mechanism and the load port." For at least this reason, Applicants respectfully request withdrawal of the Section 102 rejection of Claims 30 to 32 and 34.

Regarding Applicants' controller feature recited in Claim 2, the Examiner merely identifies a "cam 26" in Bishop, a "cam guide track 50" in Tonelli, a "track 58" & a "cylinder 63" in Harper, and "toothed wheels 4,5" in Marchetti and implies that these elements are each

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controllers by merely renaming them. The Examiner has made no attempt to explain how these different elements of the relied upon reference systems teach Applicants' "controller . . . adapted to raise the unload mechanism while substantially matching a velocity of the unload mechanism to a velocity at which the substrate carrier is transported by the conveyor." Regarding Claims 3, 6, and 15, the Examiner concedes that Marchetti does not "apply." Regarding the remaining three references, the Examiner has not identified, and Applicants cannot find, the recited features (e.g., unload mechanism that contacts the substrate carrier with substantially zero velocity or less (or substantially zero acceleration or less) in a vertical direction (or the like)) of Claims 3, 6, and 15 in any of the relied upon references. In fact, none of the relied upon references disclose any kind of motion profile that would show a "substantially zero velocity or less in a vertical direction." Thus, for this additional reason, Applicants respectfully request withdrawal of the Section 102 rejection of Claims 3, 6, and 15.

Regarding Claims 11, 16 to 19, and 26 to 29, the Examiner identifies a "work hanger engaging hook 38" with an "up-turned end 38a" as a load and unload mechanism "adapted to load a substrate carrier onto the conveyor as the conveyor is moving" (or the like) as recited in Claims 11, 16, and 26. Without explanation, the Examiner cites to the following passage from Harper (col. 5, lns. 44 to 73):

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Upon driving the ram 64 upwardly the elevator structure 23 is raised to the position of FIGURE 1. As the 45 elevator approaches the up position the plate 58 engages the rollers 45 carried on ring 44 causing the arm 39 through its pivotal connection 40 with the work transfer arms 36 to raise the work transfer arms 36 so that the work hanger engaging hooks 38^a engage beneath the lips 28^b of a work hanger to lift the hanger 28 from contact with the upturned end 27^a of hangers 27 of the monorail feed. Simultaneously the other transfer arm 36 at right angles to the one shown in FIGURE 3 is engaging the work hanger 28 carried on the rail 92. When the elevator is in the fully up position the two work hangers 28 are lifted clear of the elevator rail 92 and monorail hook 27 and are actually being supported thereabove through the rollers 45 riding on the plate 58 carried by the elevator frame 23. When this attitude has been achieved 50 the square shaft 52 rotates the transfer means including chain 56 driven through sprockets 54 and 55 to compel 55 90° rotation of the upper portion of the mast 22 and to move the work from the position of FIGURE 6 to the position of FIGURE 7 whereby a work hanger 28 carrying untreated work has been transferred from the monorail 24 to the intake of the machine through elevator 23 and a work hanger 28 carrying treated work is simultaneously transferred to the thus vacated hook 27 of the monorail feed 24 whereby the monorail passing from 70 the machine will be carrying treated work, while the monorail up to this point will be carrying untreated work to be processed.

It is not clear at all to Applicants how the above passage discloses a load/unload mechanism "adapted to load a substrate carrier onto the conveyor as the conveyor is moving." There appears to be no mention of substrate carriers or that the conveyor moves during loading/unloading. Clarification is respectfully requested. Absent clarification, Applicants assert that the Examiner's Section 102 rejection of Claims 11, 16 to 19, and 26 to 29 is further untenable and thus, respectfully request withdrawal of the rejection.

Further, the Examiner does not address the features of Claims 17 to 19 and 27 to 29. The Examiner has not identified any teaching in the reference that shows:

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"a velocity of the substrate carrier substantially match[ing] a velocity at which the conveyor is moving" (or the like) as recited in Claims 17 and 27;

"the substrate carrier contact[ing] the conveyor with substantially zero acceleration or less" (or the like) as recited in Claims 18 and 28;

"a single mechanism function[ing] as the load mechanism and the unload mechanism" as recited in Claim 19; and

"a plurality of suspension assemblies, each suspension assembly adapted to suspend a respective substrate carrier from the conveyor" as recited in Claim 29.

Regarding Claim 12, the Examiner concedes that "only Marchetti applies." From Applicants' reading of Marchetti, it appears that loading and unloading involves substantial non-zero velocity perpendicular to the path of the conveyor which is clearly unsuitable for conveying substrate carriers. Regardless however, the Examiner has not identified the feature recited in Claim 12 which states that "the unload mechanism is adapted to move in a non-rotary path." In fact, the figures in Marchetti seem to suggest a rotary path (see e.g., Figs. 1 to 3 of Marchetti).

Regarding Claim 31, the Examiner attempts to assert that a "work carrying engaging rail 69," or "fixed down rail 77," or "work carrying rail 80" (each in Harper) is a shelf as recited in Claim 31. Applicants respectfully request that the Examiner provide a basis for asserting a rail is a shelf. Absent a basis for this assertion, Applicants assert that the Examiner's Section 102 rejection of Claim 31 is further untenable and thus, respectfully request withdrawal of the rejection.

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Regarding Claim 32, the Examiner merely identifies an "extending arm 23" and a "cam 26" (note that in a prior rejection, the Examiner asserted cam 26 was a controller) in Bishop; a "material holding hook 38" and a "cam guide plate 50" in Tonelli; a "work hanger engaging hook 38" with an "up-turned end 38a" and a "track 58" in Harper; and a "cradle 2" and "toothed wheels 4,5" in Marchetti. Without explanation, the Examiner asserts that these elements from the references disclose an end effector and a linear guide, respectively. Applicants do not agree and request some basis for equating these very different elements to Applicants' claimed features. Absent a basis for this assertion, Applicants assert that the Examiner's Section 102 rejection of Claim 32 is further untenable and thus, respectfully request withdrawal of the rejection.

D. Conclusion

The Applicants believe the claims are in condition for allowance, and respectfully request reconsideration and allowance of the same. The Applicants have filed herewith an appropriate Petition for Extension of Time along with authorization to charge the requisite fee to make this response timely. If any additional fees are required,

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please charge Deposit Account No. 04-1696. The Applicants encourage the Examiner to telephone the Applicants' attorney should any issues remain.

Respectfully Submitted,



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